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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/789,327	02/27/2004	Curtis Christian Crane	20712-0090	9365

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EXAMINER	
PATEL, DHARTI HARIDAS	
ART UNIT	**PAPER NUMBER**
2836	

DATE MAILED: 07/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/789,327	CRANE ET AL.	
	Examiner	Art Unit	
	Dharti H. Patel	2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *04/11/06, 02/27/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jadric et al., Publication No. US 2003/0098668, in view of Kumar et al., Patent No. 5,691,625, and Waltz, Patent No. 5,283,708.

With respect to claims 1, Jadric teaches a drive system comprising a variable speed drive, the variable speed drive comprising a converter stage [Fig. 1, 10] to convert an input AC voltage to a DC voltage, the converter stage being configured to be electrically connectable to an AC power source [Fig. 1, V LINE]; a DC link stage [Fig. 1, 12] to filter and store energy from the converter stage, the DC link stage being electrically connected to the converter stage; an inverter stage [Fig. 1, 14] electrically connected in parallel to the DC link stage [Fig. 1, 12], the inverter being configured to converter a DC voltage to an output AC voltage to power a motor [Fig.1, 16], wherein the converter stage [Fig. 1, 10] is configured to provide a boosted DC voltage to the DC link stage [Page 1, paragraph 0009] and the inverter is configured to provide an output AC voltage greater than the input AC voltage. However, Jadric does not disclose an inverter stage comprising a plurality of inverters, and each inverter of the plurality of

inverters being connected to a plurality of motors; a plurality of connecting mechanisms, each connecting mechanism of the plurality of connecting mechanisms being connected in series between an inverter and a corresponding motor, and that each connecting mechanism being configured to disconnected an inverter from a corresponding motor in response to receiving a control signal.

Kumar teaches an inverter stage comprising a plurality of inverters [Fig. 2, INV 5, INV 6], each inverter of the plurality of inverters being configured to converter a DC voltage to an output AC voltage to power a corresponding motor of a plurality of motors [Fig. 2, TM 5, TM 6].

Waltz teaches a connecting mechanism [Fig. 1, 10], each connecting mechanism being connected in series between an inverter and a motor [Fig. 1, 20] , and wherein each connecting mechanism [Fig. 1, 10] being configured to disconnect an inverter from a motor in response to receiving a control signal [Fig. 1, a control signal coming from control circuit 16].

All three teachings are analogous variable speed drives for distributing alternating electrical current to motors via a converter stage and an inverter stage. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Waltz, with the variable speed drive of Jadric, modified by Kumar, because it is well known to use a plurality of inverter/motor units, which avoids the use of a single large inverter that may be subject to failure, and it is also well known to connect a plurality of

load control units to a control circuit to increase the ability of the system to handle the failure of one of the load/inverter branches.

With respect to claim 2, Waltz further comprises a control panel [Fig. 1, 16] to generate the control signal for a connecting mechanism [Fig. 1, 10].

With respect to claim 3, Waltz teaches that the control panel comprises means for detecting a fault condition [Fig. 1, Overload] in a motor; and means for generating the control signal [Fig. 1, 16, 17] for the corresponding connecting mechanism [Fig. 1, 10] connected to the motor [Fig. 1, 20] with the detected fault condition in response to the detection of the fault condition in the motor.

With respect to claim 4, Waltz teaches that the control panel [Fig. 1, 16] comprises means for generating the control signal in response to a control instruction from a control system controlling a motor [Fig. 1, 20] load connected to a motor [Fig. 1, 20].

With respect to claim 5, Kumar teaches that the plurality of connecting mechanism [Fig. 2, 72] comprises a plurality of contactors.

With respect to claim 6, Kumar teaches that the plurality of contactors each comprises at least one normally open contact and the control signal de-energizes the at least one normally open contact of a contactor to disconnect an inverter [Fig. 2, INV 5, INV 6] from a corresponding motor [Fig. 2, TM5, TM6].

With respect to claim 7, Kumar teaches that the plurality of contactors each comprise at least one normally closed contact and the control signal

energizes the at least one normally closed contact of a contactor to disconnect an inverter [Fig. 2, INV 5, INV 6] from a corresponding motor [Fig. 2, TM 5, TM6].

2. Claims 8-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jadric et al., in view of Kumar et al., and Waltz, Patent No. 5,283,708, and further in view of Rafuse, Jr. et al., Patent No. 5,797,729.

With respect to claims 8 and 19, Jadric teaches a variable speed drive to power the motor, the variable speed drive being configured to provide an output voltage greater than the input voltage to the variable speed drive [Fig. 1, rectifier 10 is a DC boost converter], the variable speed drive comprising a converter stage [Fig. 2, 10], a DC link stage [Fig. 2, 12] and an inverter stage [Fig. 2, 14], the inverter stage connected in parallel to the DC link stage and powering a motor [Fig. 1, 16]. However, Jadric does not disclose a plurality of inverters connected to a corresponding motor of a plurality of motors of the plurality of compressors and a plurality of contactors, connected in series between an inverter and a corresponding motor, and a control circuit.

Kumar teaches an inverter stage comprising a plurality of inverters [Fig. 2, INV 5, INV 6], each inverter of the plurality of inverters being configured to converter a DC voltage to an output AC voltage to power a corresponding motor of a plurality of motors [Fig. 2, TM 5, TM 6].

Waltz teaches a connecting mechanism [Fig. 1, 10], each connecting mechanism being connected in series between an inverter and a motor [Fig. 1, 20] , and wherein each connecting mechanism [Fig. 1, 10] being configured to

disconnect an inverter from a motor in response to receiving a control signal [Fig. 1, a control signal coming from control circuit 16].

The references do not teach providing a refrigeration system for a plurality of motors. However, Rafuse teaches a refrigeration system comprising a plurality of compressors [Fig. 1, 10, 12, 14], each compressor of the plurality of compressors being driven by a corresponding motor [Fig. 1, 34, 36, 38], the plurality of compressors being incorporated into at least one refrigerant circuit [Fig. 1], each refrigerant circuit comprising at least one compressor of the plurality of compressors [Fig. 1, 10, 12, 14], a condenser arrangement [Fig. 1, 22] and an evaporator arrangement [Fig. 1, 6] connected in a closed refrigerant loop.

All four teachings are analogous variable speed drives for distributing alternating electrical current to motors via a converter stage and an inverter stage. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Jadric, Kumar, and Waltz, which teaches a variable speed drive and a plurality of contactors, with the refrigeration system having a plurality of variable speed compressors of Rafuse for the benefit of increasing the efficiency of the refrigeration system employing variable speed compressors.

With respect to claim 9, Waltz further teaches a control panel [Fig. 1, 16] to generate a control signal for each contactor [Fig. 1, 10] of the plurality of contactors.

With respect to claims 10 and 20, Waltz teaches that the control panel [Fig.1, 16] comprises means for detecting a fault [Fig. 1, Overload] condition in a corresponding motor [Fig. 1, 20] of a compressor of the plurality of compressors; and means for generating a control signal for a corresponding contactor [Fig. 1, 10] connected to a corresponding motor [Fig. 1, 20] with the detected fault condition to disable the connecting between the inverter and the corresponding motor.

With respect to claim 11, Waltz teaches that the control panel [Fig. 1, 16] comprises means for detecting a fault condition [Fig. 1, overload] in a corresponding motor [Fig.1, 20, the motor is connected to a compressor]; and means for generating a control signal for a corresponding contactor [Fig. 1, 10] connected to a corresponding motor [Fig. 1, 20] with the detected fault condition to disable the connection between the inverter and the motor.

With respect to claim 12, Waltz teaches that the control panel [Fig. 1, 16] comprises means for generating a control signal for a corresponding contactor [Fig. 1, 10] to a corresponding motor to enable the connection between the inverter [Fig. 1, 3 phase AC supply is coming from an inverter] and the corresponding motor [Fig. 1, 20].

With respect to claims 13 and 21, Kumar teaches that the plurality of contactors comprise a plurality of normally open contacts [Fig. 2, the contacts connected between INV 6, and 14 are open].

With respect to claims 14 and 22, Waltz teaches a control signal from a control panel to disable the connection between an inverter and a motor. Kumar teaches that the open contactors are de-energized to disable the connection between an inverter and a motor upon receiving a control signal from the control panel.

With respect to claim 15, Waltz teaches a control signal from a control panel to enable the connection between an inverter and a motor. Kumar teaches that the open contactors are de-energized to enable the connection between an inverter and a motor upon receiving a control signal from the control panel.

With respect to claims 16 and 23, Kumar teaches that the plurality of contactors [Fig. 2, 72] comprise a plurality of normally closed contactors [Fig. 2, contactors connected between INV 6 and TM 6 are normally closed contactors].

With respect to claims 17 and 24, Waltz teaches a control signal from a control panel to disable the connection between an inverter and a motor. Kumar teaches that the closed contactors are de-energized to disable the connection between an inverter and a motor upon receiving a control signal from the control panel [Fig. 2, contactors connected between INV 6 and TM 6 are normally closed contactors, and opens after receiving a control signal from the control panel].

With respect to claim 18, Waltz teaches a control signal from a control panel to disable the connection between an inverter and a motor. Kumar teaches that the closed contactors are de-energized to disable the connection between an inverter and a motor upon receiving a control signal from the control

panel [Fig. 2, contactors connected between INV 6 and TM 6 are normally closed contactors, and opens after receiving a control signal from the control panel].

Response to Arguments

3. Applicant's arguments with respect to claims 1-24 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dharti H. Patel whose telephone number is 571-272-8659. The examiner can normally be reached on 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on 571-272-2800, Ext. 36. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service

Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DHP
07/24/2006

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